# Completing Your Specification
# for
# GLAZED STRUCTURES

**Instructions:**

**Step 1.** [Script highlighted in RED and enclosed in brackets are intended to be instructions for that portion of the specifications]. After completing the task, which usually requires making a selection delete the red script from the specification.

**Step 3.** Scripts highlighted in BLUE are selections items. Change the item you want to use to BLACK text and delete all the other blue text in that area of the specification.

**Step 4.** Add the project name at the top of each page and the correct page numbering system at the bottom.

**Step 5.** Delete this page from your new specification and copy and paste it into your master specification document.

**Please call Crystal Structures/Sunshine Rooms at 1-800-222-1598, ext. 108 for e sizing, model type and additional design assistance. Thank you!**

**- Continue to Specification – below**

# SECTION 13120

# GLAZED STRUCTURES

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Furnish and install a pre-fabricated, pre-engineered ALL ALUMINUM and glass structure (solarium, conservatory, vestibule)
B. Accessories and equipment
C. Glazing and gaskets
D. Sealants, caulking, joint fillers
E. Flashings

### 1.02 RELATED SECTIONS

A. Related construction materials and labor necessary in preparing the glazed structure site. This related work to be provided by other trades.
    1. Section 02315 - Excavation
    2. Section 03300 - Concrete
    3. Section 04200 - Masonry
    4. Division 15050, 15410 - Mechanical
    5. Division 16010 - Electrical and control wiring

### 1.03 REFERENCES

A. Conform to the following codes, specifications and standards (where applicable).
    1. American Architectural Manufacturers Association (AAMA)
    2. Flat Glass Marketing Association (FGMA)
    3. American National Standards Institute (ANSI)
    4. National Greenhouse Manufactures Association (NGMA)
    5. Insulating Glass Certification Council (IGCC)
    6. International Conference of Building Officials (ICBO)
    7. Building Officials & Code Administrators (BOCA)
    8. Southern Building Code Congress International (SBCCI)
    9. National Fenestration Rating Council (NFRC)
    10. Safety Glazing Certification Council (SGCC)
    11. National Sunroom Association (NSA)

### 1.04 WORK NOT INCLUDED

A. Electrical hook-up of motorized accessories.
B. Coverings to protect structure from the surrounding trades after structure is complete.
C. Site preparation.

### 1.05 PERFORMANCE AND DESIGN REQUIREMENTS

A. Maximum Allowable Deflection – All load bearing members under any design load combination (including dead load) shall not exceed L/180 of its clear span.
B. Structural Performance Requirements include providing a certified engineering report and calculations on the system performed by a structural engineering that is licensed with the appropriate state. All reports and calculations shall be stamped accordingly.
C. Live/snow loads – Withstands vertical roof loads based on ICBO/BOCA/SBCCI guidelines. Structure must meet the design load requirements in accordance to the prevailing Commercial Building Codes in effect for the local area. In most, if not all areas these codes will supersede the traditional greenhouse building codes, which are not acceptable.
D. Air Infiltration – Supply certified testing reports adhering to the requirements set forth by ASTM-E283-4, 6.24 PSF and 300 Pa.
E. Static water resistance – Supply certified testing reports adhering to the requirements set forth by ASTM-E331, 20 PSF and 950 Pa.
F. Dynamic water resistance – Complies with testing per AAMA-501.1
G. Wind loading – Withstands wind loads based on ANSI-A58.1/ASCE-7 guidelines and 90 mph wind, exposure C per Uniform Building Code or local requirements, whichever is greater.
H. Provide a pre-engineered weepage system that collects condensation and directs it to the exterior of the greenhouse.
I. Aluminum framing system shall be thermally broken which will significantly reduce the transfer of heat and cold through the frame and reduce condensation on and within the framing members.
J. Glazing performance requirements - See Glazing selections within this section.
K. LEED program /Green Design, using recycled aluminum content in excess of 60%.

**1.06 SUBMITTALS**

A. Submit [add quantity] _____ copies of shop drawings per Section 01300 to the Architect for review and approval prior to fabrication. Shop drawings to address the following items;
    1. Product anchorage of framing members
    2. Foundation layout guide (excluding foundation design or engineering)
    3. Framing connection and details
    4. Glazing methods and sealing procedures
    5. Flashings
    6. Special adaptations of systems to specific project requirements
B. Manufacturer's product data sheets specifying products, features, details, and usage.
C. Data sheets for all accessories used within the greenhouse (i.e. fans, shades, coolers, and heaters).
D. Submit [add quantity] _____product samples as follows;
    1. Provide 12" x 12" glazing samples
    2. Structural framing members
    3. Aluminum samples representing manufacturer's standard aluminum finish colors.

**1.07 DELIVERY, STORAGE, AND HANDLING**

A. Deliver materials to jobsite freight prepaid.
B. Retain and leave intact all manufacturers' packaging.
C. Take extra precautions when unloading and storing materials to protect all prefinished surfaces and all glazing materials.
D. Store off ground in a secure location that is a dry covered area and protected from weather conditions.
E. Inspect and report any freight damages immediately to the manufacturer.

**1.08 WARRANTY**

A. Provide complete manufacturer's limited warranty agreement on the following materials.
    1. Structural aluminum frame – 10 year limited warranty against manufactured defects and lifetime warranty on aluminum members against rust.
    2. Frames finish [SELECT ONE AND DELETE THE OTHERS]
        a) PPG Acrylic Duracron (meets AAMA 2603)– Limited 5 years against fading, peeling and chalking
        a) Class I Anodized finish (meets AAMA 611) – Limited 10 year against corrosion and finish deterioration
        a) 2 coat Fluoropolymer finish (meets AAMA 2605) – Limited 10 year warranty against peeling, fading and chalking
        a) 3 Coat Fluoropolymer finish (meets AAMA 2605) – Limited 15 year warranty against peeling, fading and chalking
    3. Installation – Limited one year warranty against defective workmanship.
    4. Glazing – 10 year warranty against seal failure

B. Provide complete warranty information on all manufacturers providing accessories within the structure (i.e. fans, heaters, shades, etc). These manufacturers to supply their standard warranty.

**1.09 SCHEDULING AND COORDINATION**

A. No concrete or other related construction (in the area) work shall commence until the shop drawings have been approved by the architect and general contractor.
B. All related construction work such as foundations, knee walls, stem walls, door openings, etc. shall be governed by the approved shop drawings.
C. General contractor to coordinate and contract with all sub-contractors providing electrical, plumbing, HVAC, control wiring, etc. to the structure.
D. Field dimensions will be obtained by general contractor or architect and forwarded to the structure manufacturer. General contractor will be responsible for ensuring all job site dimensions will be built to the approved glazed structure shop drawings.
E. Coordinate all work through the general contractor.

**1.10 QUALITY ASSURANCE**

A. Manufacturer Qualifications: Company shall have at least 10 years of experience in the manufacturing and erection of glazed at similar size and scope as this project. Manufacturer will be responsible for the installation of the structure.

B. Installer Qualifications: Installer shall have at least 5 years experience in the erecting of glazed structures at similar size and scope as this project. The installer will work directly for the manufacturer, providing the owner a single source provider.

## PART 2 – PRODUCTS

**2.01 ACCEPTABLE MANUFACTURERS** – Product based on Crystal Structure's model Insert model or style, as provided by:

A. Crystal Structures, Commercial Division of Sunshine Rooms, Inc.
3333 N. Mead
Wichita, KS 67219
1-800-222-1598 / 316-838-0033 / Fax 316-838-0839
www.sunshinerooms.com

B. Substitution requests as per Section 01600.

**2.02 MATERIALS**

A. Structural Framing System
   1. Structural Aluminum Members: Shall be extruded aluminum from 6061-T6 or 6005-T5 alloy, non-structural members shall be 6063-T5.
   2. All interior horizontal aluminum members shall utilize poured and de-bridged thermal barrier technology using polyurethane as the thermal barrier.
   3. Exterior horizontal mullion assemblies shall not extend higher than 1/8" above the glazing.
   4. Exterior "snap-on" bar cap covers shall cover the entire surface of the bar cap without seams, fasteners or joints. Exposed exterior fasteners are unacceptable.
   5. Frame system shall incorporate a pre-engineered weepage system that is capable of collecting moisture and forcing it to the exterior of the greenhouse.
   6. Primary vertical aluminum members shall have a built-in "accessory track" capable of accepting machine screws without drilling holes into the aluminum for the hanging and relocating of accessories.
   7. Primary vertical aluminum members shall incorporate built-in shade tracks that will allow the installation of a shade system without drilling holes into the aluminum and adding mounting hardware.
   8. Internal structural stiffeners: In an effort to meet higher design loads, internal stiffeners will be allowed, provided they have been pre-engineered and installed within the interior of the main rafters. Internal stiffeners shall be aluminum and the alloy shall be 6061-T6. "BOLT-ON" BEAMS OR OTHER MECHANICAL ENHANCEMENTS WILL NOT BE ALLOWED.
   9. Pan flashings to be a minimum of 0.04" thick and shall be in the same finish as the frame. Exterior flashings in excess of 6" wide will be increased to a minimum thickness of 0.063" and in the same finish as the frame.

B. Gaskets, Glazing Tape and Setting Blocks
   1. Gaskets shall be EPDM or Santoprene with a 60-70 durometer and compatible with all materials it comes in contact with.
   2. Gaskets shall comply with the ASTM-C-864 standards.

3. Gaskets to be multi-finned style designed to significantly reduce water penetration.
4. Glazing tape shall be closed cell, PVC foam with double-sided acrylic adhesive.
5. Glass setting blocks shall be made of flexible PVC and be compatible with insulated glass.

C. Fasteners
   1. All connections shall be made with 18-8 stainless steel fasteners.
   2. Anchor bolts shall be 18-8 stainless steel and shall be identified in detail in the job specific shop drawings and engineering reports. Anchor bolts shall not penetrate the sub-sill flashing provided by the manufacturer.
   3. Exposed fasteners should be avoided wherever possible; if necessary they shall be painted to match the system's frame.

D. Silicone Sealant
   1. Areas within the glazing area.
      a. Silicone sealant shall meet or exceed federal specifications TTS-001543A.
      b. Color shall be black to match the other glazing rubber at all metal to glazing joints.
      c. Color shall match the frame color (within reason) on joints that are metal to metal.
   2 Joints that connect to adjacent building(s).
      a. Use an adhesive silicone, GE SilPruf or equal.
      b. Color to be black.

E. Glazing shall be as follows. [Select option 1 or 2 and delete the other]
   1. Insulated glass with the following configuration.
      a. Outboard light - 1/8" fully tempered clear glass
      b. Air space – Stainless steel spacer with dual seals of polyisobutylene/silicone and argon gas
      c. Inboard light – Vertical – 1/8" fully tempered clear glass
         Roof Area – ¼" HS clear laminated with .030 PVC film
      d. Hi-performance coating – SilverCoat E366 on surface 2
      e. Performance criteria shall be:
         U-factor = .24
         Daylight transmission = 66%
         Relative heat gain = 66
         Solar heat gain coefficient = .27
         Light to solar gain (LSG) = 2.41

   2.Glass as specified in Section 08800

**2.03 FRAME FINISH** [REFER TO PAGE 5 OF THE DESIGN GUIDE WHEN MAKING YOUR SELECTION FOR THE FRAMES FINISH. SELECT ONE, THEN SELECT THE COLOR, THEN DELETE ALL SPECIFICATIONS NOT USED]

A. All visible aluminum extrusions shall have a factory applied, baked acrylic finish using PPG Duracron and shall adhere to the physical test requirements of AAMA 2603 specifications with a 5 year warranty.
Color selection: [SELECT ONE AND DELETE THE OTHERS]
1. White
1. Bronze
1. Custom - full range of supplier's standard color selections (architects' choice).
1. Custom – (architect's choice).

A. All visible aluminum extrusions shall have an anodic Class 1 finish of at least 0.7 mil thickness (18 microns) and meet or exceed the specifications outlined in AAMA 611 with a 10 year warranty.
Color selection: [SELECT ONE AND DELETE THE OTHERS]
1. Clear
1. Medium bronze
1. Custom - Full range of suppliers offerings (architect's choice).

A. All visible aluminum extrusions shall have a factory applied, baked-on, 70% PVDF fluoropolymer resin based coating (Fluropon or Fluropon Classic II) as manufactured by the Valspar Corp. Coating shall meet or exceed the AAMA 2605 specification.
Color selection and type; [SELECT ONE AND DELETE THE OTHERS]
1. Fluropon (10 year warranty) – Standard White.
1. Fluropon (10 year warranty) - Standard Bronze.
1. Fluropon 2 coat (10 year warranty) - Color selected from suppliers standard solid color chart (architect's choice).
1 Fluropon Classic II 2 coat (10 year warranty) Metallic – Color selected from suppliers standard color chart (architect's choice).
1. Fluropon 2 coat (10 year warranty) - Custom color to be selected by the architect.
1. Fluropon 3 coat (20 year warranty) - Color to be selected from supplier's standard color chart (architect's choice).
1. Fluropon 3 coat (20 year warranty) - Custom color to be selected by architect.

A. All visible aluminum extrusions will be finished utilizing the following two-tone paint scheme.
1. Interior portion - shall have a factory applied, baked acrylic finish using PPG Duracron and shall adhere to the physical test requirements of AAMA 2603 specifications with a 5 year warranty.
Color selection: [SELECT ONE AND DELETE THE OTHERS]
a. White
b. Bronze
2. Exterior portion - shall have a factory applied, baked-on 70% PVDF fluoropolymer resin based coating (Fluropon or Fluropon Classic II) as manufactured by the Valspar Corp. Coating shall meet or exceed the AAMA 2605 specification.
Color selection and type: [SELECT ONE AND DELETE THE OTHERS]
1. Fluropon (10 year warranty) - Standard White.
1. Fluropon (10 year warranty) - Standard Bronze.
1. Fluropon 2 coat (10 year warranty) - Color selected from suppliers standard solid color chart (architect's choice).
1. Fluropon Classic II 2 coat (10 year warranty) Metallic – Color selected from suppliers standard color chart (architect's choice).

1. Fluropon 2 coat (10 year warranty) – Custom color to be selected by the architect.
1. Fluropon 3 coat (20 year warranty) - Color to be selected from supplier's standard color chart (architect's choice).
1. Fluropon 3 coat (20 year warranty) - Custom color to be selected by architect.

B. All finishes of the related equipment as defined in Sec 2.06 of this specification shall be as per the original manufacturer's specified finish. These finishes may or may not match the greenhouse frame finish. In an effort to preserve the original warranty they will not be painted to match the greenhouse frame.

## 2.04 FABRICATION

A. All fabrication shall be done according to the final set of approved shop drawings. Approved shop drawings shall supersede all previous blueprints or documents.
B. All major fabrication shall be performed at the manufacturing location.
C. Manufacturer must be notified prior to any field fabrication or modifications.
D. All welding will comply with the recommendations set forth by the American Welding Society.
E. Perform all work in such a manner that it will meet or exceed industry standards.
F. Dissimilar metals will be separated with suitable materials as required to prevent galvanic action between the metals.

## 2.05 PRIMARY ACCESSORIES (Vents and doors manufactured by the glazed structure manufacturer) Delete or include accessories as desired

A. **Shade System –** Supply and mount Comfort Glide shade system by Thermal Designs in roof area. Shades to be manually operated with use of pull cords and pulleys. ALL HARDWARE TO BE RECESSED WITHIN STRUCTURE'S RAFTERS AND ABOVE THE SHADES. THE ONLY EXPOSED HARDWARE SHALL BE THE PULL CORDS AND WALL CLEATS. Fabric and color selection by architect. (Motorized shades are also available)
B. **Awning windows-** Quantity, size and location as depicted on the architectural drawings. Awning windows shall have thermally broken frames with glazing and frame finish to match surrounding structure. Includes insect screens and push bar manual operation.
C. **Roof vents –** Quantity, size and location as depicted on the architectural drawings. Frame finish and glazing shall match balance of roof. Vents shall have insect screens. Operation shall be – 1. Manual worm gear operation with telescoping pole or 2. motorized operation with Truth Marvel motors.
D. **3' Commercial swing door(s) –** Quantity and location as depicted on architectural drawings. Narrow stile Series 100 as manufactured by Manko Windows. Hardware shall include Regent off-set pivots, Regent closure #3354, MS lock with hook bolt and mortise cylinder with Schlage C-keyway. Doors shall either 1. Push/pull handle set or 2. Panic hardware with first choice rim panic and 10" exterior pull handle. Door frame finish and glass shall match surrounding structure.

E. **Other accessories as specified** (fans, heating or cooling, double doors, custom trim features, extruded aluminum gutter and downspouts)

## PART 3 - EXECUTION

### 3.01 SITE PREPARATION, UNLOADING, LIFTING AND INSPECTION

A. Glazed Structure contractor shall direct, supervise, and inspect all site work related to the structure. Site preparation must be in accordance to the final shop drawings provided by manufacturer and approved by the architect. Related site work must be level, square, and plumb. All dimensions must be according to the final shop drawings.
B. Structure contractor shall examine surrounding structure and the conditions under which the work is to be performed, and notify the general contractor and architect in writing of any conditions detrimental to the proper and timely completion of the job. Installation shall not proceed until any and all unsatisfactory conditions have been corrected in an acceptable manner to the structure contractor.
C. Structure contractor to supply all labor necessary to unload all of its materials from delivery trucks.
D. General contractor, under supervision of the glazed structure contractor will lift the structure components to desired working / installation heights on projects in which the structure is located above ground level. General contractor to accept all associated lifting costs.
E. Structure contractor shall deliver all related operating instructions, maintenance manuals and warranty registration cards to the general contractor prior to the completion of the project.

### 3.02 INSTALLATION

A. Shall be in accordance with manufacturer's installation instructions and performed by an installer with at least 5 years of related experience.
B. All work performed will be at or above industry standards.
C. All workmen will follow all safety rules or conditions as set forth by the general contractor

### 3.03 CLEANING

A. Structure contractor shall keep area neat, clean, and safe at all times.
B. Remove excess sealant compounds from aluminum and glass surfaces promptly after completion.
C. Structure contractor to place all trash and debris into trash receptacle provided by the general contractor.
D. Structure contractor shall clean the entire greenhouse one time, at the time of installation. All subsequent cleaning will be the responsibility of the general contractor.

**END OF SECTION**